BIOLOGICAL EVALUATION
For
TERRESTRIAL & AQUATIC FOREST SENSITIVE SPECIES
Forest-Wide Invasive Plants Treatment Project

Inyo National Forest
FY2018

Truman Meadow system with native grasses, milkweed and pinyon pines

PREPARED BY: *Kary Schlick* Fish & Wildlife Biologist DATE April 10, 2019

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Inyo National Forest

INTRODUCTION

This Biological Evaluation (BE) addresses the potential effects of the invasive plants project for the Inyo National Forest on animal species listed as sensitive by the Regional Forester of the Pacific Southwest Region of the U.S. Forest Service (Table 1). Sensitive species include species, which are not designated as federally threatened or endangered, but for which range-wide rarity is of concern. The sensitive animal species list for Region 5 of the Forest Service was last updated on September 9, 2013. The effects of the invasive plants project on Inyo National Forest sensitive species are evaluated below. The purpose of the Biological Evaluation is:

- To ensure that the Inyo National Forest projects do not contribute to loss of viability of any forest sensitive animal species;
- To provide a process and standard to ensure forest sensitive species receive full consideration during the decision making process as well as during the projects Annual Implementation Process

Forest Service Manual 2672.41 specifies that a biological evaluation be prepared to determine if a project may affect any USDA Forest Service (FS) sensitive species. The purpose of this biological evaluation evaluates the Forest-wide Invasive Plants Treatment Project proposed by the Inyo National Forest (INF). It includes two alternatives and is described in detail in the Invasive Plants Treatment Draft Environmental Assessment (EA).

During 2017 Forest Plan Revision, INF (2017FPR_BA) and the USFWS agreed that the following species were not likely to occur on the INF nor be impacted by Forest Service actions: North American wolverine, California condor, Least Bell's vireo, Yellow-billed cuckoo, western U.S. Distinct Population Segment (DPS), Western snowy plover, Pacific Coast DPS, Delta smelt, Little Kern golden trout, Steelhead, northern California DPS, Owens pupfish. Therefore of these that are Inyo NF Forest sensitive species; North American wolverine, Yellow-billed cuckoo, western U.S. Distinct Population Segment (DPS) and Owens pupfish, will not be analyzed further. In the event this information changes in the future analysis and assumptions using marten, flycatcher, and aquatic species could be used as proxy.

CURRENT MANAGEMENT DIRECTION

The forest is currently managed under the 1988 Inyo National Forest Land and Resource Management Plan (Forest Plan), plus amendments, including the 2001 and 2004 Sierra Nevada Forest Plan Amendments. The forest plan includes management prescriptions, standards and guidelines, and other plan components that apply to all activities on the Inyo National Forest.

Sensitive species are designated by the Regional Forester. United States Department of Agriculture Regulation 9500-4 directs the Forest Service to:

- Manage "habitats for all existing native and desired nonnative plants, fish, and wildlife species in order to maintain at least viable populations of such species."
- Conduct activities and programs "to assist in the identification and recovery of threatened and endangered plant and animal species."
- Avoid actions "which may cause a species to become threatened or endangered."…in FSM 2670.12, and…
- Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.
- Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.
- Develop and implement management objectives for populations and/or habitat of sensitive

species…in FSM 2670.22.

PROPOSED ACTION

This report analyzes the effects of both the Proposed Action (Alternative 1) and No Action (Alternative 2). The project includes manual, mechanical, cultural, biological, and chemical treatment options for invasive plants of management concern on the INF. Existing infestations as well as infestations detected in the future would be prioritized for treatment, with site-specific methods developed and reviewed annually by an interdisciplinary team. The project area encompasses all federal lands managed or administered by the INF (approximately two million acres) in Fresno, Inyo, Madera, Mono and Tulare Counties, California, and Esmerelda and Mineral Counties, Nevada. See the EA for a full discussion on the proposed action.

GENERAL EFFECTS & PRESCRIPTIONS

General Effects to Species from Treatment Activities Associated with the Proposed Action

Assuming a treatment method meets design features and is effective, practical, and cost-efficient, treatment methods would be selected in the following order of preference (see EA for full discussion):

1. Manual and mechanical methods such as hand pulling and cutting
2. Cultural methods such as tarping, flaming, or light wands
3. Herbicide application
4. Biological control (biocontrol) methods

The Proposed Action has the potential to affect species through the following:

1. Disturbance of individuals from noise or visual disturbance associated with treatments;
2. Secondary effects upon habitat
3. Toxicity from acute or chronic exposure to herbicides

Disturbance or Displacement

Under the proposed action, all of the treatment methods have the potential to cause some level of disturbance and/or temporary displacement to wildlife. The most common treatment methods that will be used in the project area include manual (hand digging, pulling, clipping and bagging), herbicide, and biological (insects) treatments. Manual treatments generally include crews walking into a treatment site, carrying hand tools, weed wrench, shovel, and hoe are involved. Mechanical and herbicide treatments are also conducted by crews walking and carrying backpack sprayers but treatments can also include the use of motorized equipment such as one or two UTV or spray trucks, chainsaw, hand-held propane torch, and string-trimmer. Because manual techniques are slower than mechanical methods, the duration of disturbance, caused by the presence of people, may be longer in the treatment area but generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season; therefore there would be no long term impacts to species. The presence of crews during treatments may generate noise sufficient to flush birds from a nest or interfere with feeding of nestlings if conducted in proximity to nests. Other wildlife such as big game may avoid treatment areas while weed crews are in the area especially remote areas where species are not as habituated to human presence. Typically, the more remote areas infestations are smaller in scope and scale, other species would likely only be disrupted

temporarily before adjusting to the presence of crew and returning to the area.

Tarping or solarization involves covering the infested area with a barrier, usually plastic, to raise soil temperature and block light. Mulch, such as wood chips or rice straw, may be used to smother or shade out invasive plants. These methods generally occur in locations such as borrow pits or closed roads, where native vegetation is not yet established. Tarping can result in displacing small mammals, reptiles and insects by covering areas where burrows, rock and wood cover are used.

Other less used treatment methods under the proposed action including mowing and digging. Both of these activities have the potential to displace wildlife for longer periods of time while vegetation conditions recover. However, both of these techniques are generally only used when an infestation has become a contiguous monoculture of noxious and/or invasive weeds. Monocultures are comprised of single species, non-native plants that generally provide very little value to most wildlife species.
Therefore, treatments in these areas would result in disturbance to very few wildlife species. Within the project area, the majority of weeds occur as small isolated patches and not contiguous infestations and mowing could be used as a pre-treatment to herbicide.

Effects to nocturnal and crepuscular Forest Sensitive species including the bats, owls and Panamint alligator lizard will be minimal as weed crews would only be conducting treatments during daylight. During the Annual Implementation Process, the District Weed Manager will coordinate with the biologist to be made aware of any new information and sensitive areas (such as active nest sites, rare amphibian breeding areas) so that disturbance can potentially be avoided during critical time periods.

Habitat Alteration

Invasive plant treatment methods described in the Proposed Action can result in short term effects to habitat. Due to the small and patchy nature of most of invasive plant infestations on the INF however, the amount of cover lost would not have any measurable effect on wildlife populations. Where invasive plants occur in large, dense patches, treatments can temporarily create bare ground by reducing plant cover. The removal of invasive plants can, in the short-term, decrease the amount of vegetative cover available to wildlife, particularly true in areas where the goal is to remove the majority of the vegetation within the infestation. While the vegetation is recovering, which could occur over a period of one to five years, the area would likely provide limited value to wildlife. However, removal of invasive plants generally increases the diversity of native herbaceous and shrub species within treated areas. **For the most part, invasive plant treatments restore, rather than reduce, habitat available to wildlife and the successful control of invasive plant infestations provides long-term benefits by restoring and preventing further loss of native habitat.**

Insects used to treat noxious weeds are host specific and would not impact native plant species. Under the Proposed Action, only biological control agents that are permitted for release by the **USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) or Nevada Department of Agriculture (NDA)** will be used. Biological control agents that would be used under the proposed action include insects, fungus, and bacteria. The US Department of Agriculture, Agricultural Plant Health and Insect Services (APHIS) is the lead agency for biocontrol activities in the US, and is required to complete NEPA analysis and documentation before allowing the use of a specific biological control agent. Before being permitted

by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). Treatment strategies proposed here use the same strategies as CDFA with a list of invasive plants with high environmental impacts prioritized. The project proposal is aligned with the CDFA for **the successful control of the state-listed noxious weeds.** Utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal **and provides long-term benefits by restoring and preventing further loss of native habitat by such infestations.**

Herbicide Toxicity

When working with herbicides there is a remote risk of accidental spills, accidental equipment malfunction or other exposure scenarios other than those described above. To limit the potential for herbicide spills impacting threatened and endangered aquatic species, mixing and loading of herbicides would not occur in or near any occupied habitat for these species (DF #6 & 7). Mixing will occur only on level, disturbed sites off of roadways, such as the interior of landings, and water drafting from aquatic features would not occur (DF # 6 & 36). Project design feature requires preparation for application to occur outside Riparian Conservation Areas and other sensitive sites buffers (DF # 6, 15, & 28). Project design features requiring regular inspection and tests of all equipment used for herbicide application would greatly reduce the risk of herbicides spills when working in these sensitive areas (DF #3). In addition, a small spill containment kit would be carried by herbicide applicators to further limit potential effects in the event of equipment failure (DF #7).

The use of herbicides has the potential to affect wildlife through acute or chronic exposure. The effects of herbicide use depend on the toxicity of the herbicide, the level of exposure to that herbicide, and the duration of that exposure. Risk assessments were completed for all herbicides proposed for use in this project. Risk assessments evaluate the potential effects to non-target plants, wildlife, human health, soils, and aquatic organisms from the herbicides considered for use within the project area. The Forest Service contracts with Syracuse Environmental Research Associates, Inc (SERA) to evaluate human health and ecological effects of herbicides using EPA studies and other peer-reviewed articles from the open scientific literature. Information from laboratory and field studies of herbicide toxicity, exposure, and environmental fate was used to estimate the risk of adverse effects to non-target terrestrial and aquatic organisms, humans, water, and soil. Table 6 identifies the risk assessments available by active ingredient; these may be accessed online at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml.

Herbicides Analyzed

Table 6. Risk Assessments for herbicides analyzed and reference

Herbicide (Active Ingredient)	Date Final	Risk Assessment Reference
Aminopyralid	June 28, 2007	SERA TR-052-04-04a
Chlorsulfuron	November 21, 2004	SERA TR 04-43-18-01c
Clethodim	October 30, 2014	SERA TR 056-08-02b
Clopyralid	December 5, 2004	SERA TR 04-43-17-03c
Fluazifop-P-Butyl	July 21, 2014	SERA TR-056-07-02 a

Glyphosate	March 25, 2011	SERA TR-052-22-03b
Imazapyr	December 16, 2011	SERA TR-052-29-03a
Triclopyr: triethylamine salt (**TEA & BEE**)	May 24, 2011	SERA TR-052-25-03a

In addition to the analysis of potential hazards to wildlife from the active ingredients in the herbicides, SERA Risk Assessments evaluated available scientific studies of potential hazards of other substances associated with herbicide applications: impurities, metabolites, inert ingredients, and adjuvants. There is usually less toxicity data available for these substances (compared to the herbicide active ingredient) because they are not subject to the extensive testing that is required for the herbicide active ingredients.

Risk assessments are a qualitative evaluation of the probability that the use of an herbicide may pose a risk to human health or the environment (FSM 2150.5). The risk assessments contain:

1. Hazard Characterization - What are the dangers inherent with the active ingredient?
2. Exposure Assessment- Who could come into contact and how much?
3. Dose Response Assessment - How much is too much?
4. Risk Characterization - Indicates whether or not there is a plausible basis for concern.

The risk assessments considered worst-case scenarios including accidental exposures and application at maximum label rates. Although the risk assessments have limitations, they represent the best science available. The risk assessment methodologies and detailed analysis is incorporated into references of conclusions about herbicide toxicology in this document.

Herbicide Terminology

The following terminology is used throughout this document to describe relative toxicity of herbicides proposed for use in the alternatives

Threshold of Concern: A level of exposure below which there is a low potential for adverse effects to an organism. Effects on wildlife and other organisms are **considered insignificant and discountable** when herbicide exposure is below the threshold of concern.

Hazard Quotient (HQ): A "toxicity threshold" was established for each herbicide to indicate the point **below which adverse effects would not be expected for a variety of organisms (e.g. people, wildlife, fish**). The predicted level of exposure from herbicide use is compared to the toxicity threshold and expressed in terms of a "hazard quotient (HQ)." The Hazard Quotient is the amount of herbicide or additives to which an organism may be exposed over a specified period, divided by that estimated daily exposure level at which no adverse health effects are likely to occur. An **HQ less than or equal to one indicates an extremely low level of risk**. Toxicity thresholds are based on extrapolated laboratory results and accepted scientific protocols. The probability of harmful effects increases with HQ.

Level of Concern (LOC): An estimate of exposure above which there may be adverse effects; in risk assessments this is defined as a **HQ of more than one**.

No Observable Adverse Effects Level (NOAEL)- Where research has shown no statistically significant effect when compared to animals not exposed to the chemical. Thus hazard quotients

(HQ) of less than 1.0 indicate that the exposure poses little reason for concern. Hazard quotients greater than 1.0 pose concern for effects to wildlife.

Exposure Scenario: For each ecological risk assessment, a set of general exposure scenarios based on the low, typical, and maximum label rates of the herbicides are analyzed. For wildlife, **exposure scenarios included the animal being directly sprayed; ingestion of contaminated vegetation, prey species, or water; grooming activates; and indirect contact** with contaminated vegetation.

The application rate and method influences the amount of herbicide to which an organism may be exposed. Analysis of effects to wildlife from herbicides and the associated surfactants or dyes proposed for use in this project, utilizes risk assessments based upon Human Health and Ecological Risk Assessment reports prepared by Syracuse Environmental Research Associates which utilize the best available science to describe the level of herbicide expected to be introduced, persist, and transport within the forest environment, and to evaluate the likelihood of adverse ecological effects. Only herbicides that have SERA risk assessments are proposed in this action. The SERA risk assessments use peer-reviewed articles from the open scientific literature and current EPA documents. The likelihood that an animal will experience adverse effects from an herbicide depends on: toxicity of the chemical, (2) the amount of chemical to which an animal is exposed, (3) the amount of chemical actually received by the animal (dose), and (4) the inherent sensitivity of the animal to the chemical, all of which are evaluated in FS/SERA risk assessments.

Risk Assessment by Group

When enough data was available for a particular type of animal, an exposure scenario was developed, and a quantitative estimate of dose received by the animal type in the scenario was calculated as described in the SERA risk assessments. The quantitative estimates of dose were compared to available toxicity data to determine potential adverse impacts. Because of the uncertainty with regard to how accurately a surrogate species may represent other species, the FS/SERA risk assessments use the most sensitive endpoint from the most sensitive species tested as the toxicity index for all wildlife. The estimated dose (from the scenarios) is divided by the "toxicity index" and the result is known as the Hazard Quotient. When the Hazard Quotient is less than 1.0, the dose is less than the toxicity index. Potential effects from doses calculated to be below the toxicity indices are discountable. When a calculated dose was greater than the toxicity index, there is a potential for adverse effects. This very protective approach constitutes a "worst-case" analysis for potential effects of herbicides.

Terrestrial animals might be exposed to any applied herbicide **from direct spray, the ingestion of contaminated media (vegetation, prey species, or water), grooming activities, or indirect contact with contaminated vegetation**, and these sources of exposure were considered in the risk assessments used for this analysis. As discussed above, the threshold of concern is the "no observable adverse effect level" (**NOAEL**), where research has shown no statistically significant effect when compared to animals not exposed to the chemical. Thus hazard quotients (HQ) of less than 1.0 indicate that the exposure poses little reason for concern. Hazard quotients greater than 1.0 pose concern for effects to wildlife. **Risk assessments show that the highest exposures for terrestrial vertebrates would occur after the consumption of contaminated vegetation or contaminated prey. Other routes of exposure, including direct spray, dermal contact with contaminated**

vegetation, ingestion of contaminated water, or the consumption of contaminated fish, lead to levels of exposure considerably below the level of concern for all species groups and all herbicides being considered in this project. Thus, the following discussion focuses on acute and chronic herbicide exposures resulting from ingestion or exposure to contaminated vegetation or prey, for the herbicides included in the Proposed Action.

Mammals

Review of exposure scenarios and risk characterizations for, aminopyralid, imazapyr, chlorsulfuron, clethodim, clopyralid, fluazifop-p-butyl, and glyphosate, indicate that for both acute and chronic exposures, hazard quotients are **below the threshold of concern, 1.0**, in all exposure scenarios. For example, Clethodim acute toxicity to mammals is classified as practically nontoxic. The assessments included consideration of accidental acute exposure (from direct spray, or contamination following a spill), non-accidental acute exposures (from contaminated vegetation, water, or consumption of contaminated insects or small mammals), and from chronic/longer term exposures associated with consumption of contaminated vegetation, water, or fish. For example, clopyralid in one long-term (8 year) field study has been conducted that indicates no substantial or significant effects on plant species diversity (Rice et al 1997). For chronic exposures, all HQs are below one (0.3) therefore there is no basis for asserting that adverse effects are likely from the application of clopyralid (FS). The weight of evidence from available studies suggests that **no adverse effects to mammals are plausible** using typical or worst-case exposure assumptions at application rates proposed in this project. Hazard quotients for all exposure scenarios, at both the central and upper range, are well below one (the level where potential effects from doses are considered discountable). This indicates there is a **low level of concern** that application of these above mentioned herbicides in this project would adversely affect mammals.

Review of the risk characterization for triclopyr, however, indicates that HQs exceed the level of concern (HQ > 1) for exposures to mammals involving the consumption of contaminated vegetation. The HQs for mammals increase as body weight increases. While small mammals may consume more than larger animals, the higher sensitivity of larger mammals to triclopyr suggest they are at greater risk. The high hazard quotients particularly for large mammals under chronic exposure to contaminated vegetation, suggest the potential for adverse effects. **The "worst case" exposure scenarios do not, however, account for factors such as timing and method of application, animal behavior and feeding strategies and/or implementation of project design criteria.** When these factors are considered, it is evident that **risk is overestimated** for both the acute and chronic exposure scenarios relative to the Proposed Action.

Under the acute exposure scenario, the environmental risk model assumes that 100 percent of the animal's diet is made up of contaminated vegetation within a 24-hour period. Under the chronic exposure scenario, it is assumed that 30 percent of an animal's diet will come from treated vegetation over a 90-day period. Since treated plants will **rapidly brown and die, they will not remain palatable or available as forage for more than about five to ten days** following treatments, making the chronic scenario implausible. Furthermore, triclopyr would be used to potentially treat tamarisk and other woody weeds, **which currently occurs in the project area in limited numbers and are not known to be desirable forage or generally browse by FS listed or local species.** The

preferred treatment method is hand application to cut stumps using triclopyr in a hand-held applicator but spraying small plants or resprouting shoots may occur as a follow-up treatment. Hand application limits the likelihood of drift and subsequent exposure to herbivorous mammals. For these reasons, the magnitude of risk for mammals or FS listed species consuming vegetation treated with triclopyr under the Proposed Action is considerably less than the risk characterization provided in the SERA risk assessments.

In addition, the quantitative risk characterization must be tempered by information from field applications of triclopyr. None of the available field studies of wildlife report adverse effects which might be attributed to the toxicity of triclopyr. This may be because the upper bound HQs represent multiple worst case exposure assumptions that may not occur frequently in the field. Another likelihood is that many mammals, such as deer, are likely to avoid treated areas. If larger mammals avoid treated areas, the proportion of the contaminated diet could be much less than 100 percent and as the proportion of the diet that is contaminated decreases, the HQs will also decrease. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as tamarisk. The typical method for Triclopyr would be applied using cut-stump application which will minimize the risk of non-target exposure and accidental drift.

Birds

Review of exposure scenarios and risk characterizations for aminopyralid, imazapyr, chlorsulfuron, clethodim, clopyralid, fluazifop-p-butyl, and glyphosate indicate that there are no toxicity effects anticipated in birds. This was true for scenarios involving direct spray, consumption of contaminated vegetation, contaminated insects, or contaminated prey. For example, clethodim acute toxicity is classified as practically nontoxic for birds. Additionally, clopyralid studies on birds, bees, spiders, and earthworms generally support the characterization of clopyralid as relatively non-toxic. In addition, Dabbert et al. (1997) have found that direct spray of bobwhite quail eggs with clopyralid caused no gross effects (i.e., viability, hatchability, body weight) and no effects on immune function (humoral or cell-mediated) in chicks. The HQ value is below the level of concern for all exposure scenarios even at the upper limit of plausible doses. The EPA classifies Fluazifop-P-butyl as practically nontoxic to birds based on dietary values. In addition standard reproduction studies were conducted in mallards and quail. In both studies, no statistically significant signs of toxicity or effects on reproduction were noted.

For triclopyr, scenarios involving consumption of contaminated vegetation or contaminated insects by a small bird (10 g) resulted in HQs that exceeded one for both acute and chronic exposures at the central and upper bounds. As described for mammals, however, the targeted use of triclopyr under the proposed action, minimizes the exposure of birds to vegetation or insects treated with triclopyr over any length of time. Birds are very unlikely to consume 100 percent of their diet in contaminated vegetation or insects over a 24 hour period, and the chronic exposure scenarios (30 percent of the diet over a 90-day period) would be even less plausible, since treated vegetation will brown and die. **This is an important point regarding foraging concerns for any herbivore, the fact that herbicides change the value of the weed quickly to becoming unpalatable. All exposure scenarios for a large bird, such as an eagle, are below the threshold of concern.** Under the Proposed Action, triclopyr will only be used in limited situations (spatially and temporally), primarily to treat woody species such as Siberian elm, tree of heaven, Russian olive, and salt cedar as well as yellow star thistle, Himalayan blackberry, and bouncing bet. Triclopyr will be applied using direct hand

application and directed foliar, basal bark spray, and drizzle which will minimize the risk of non-target exposure and accidental drift.

Invertebrates

Review of exposure scenarios and risk characterizations for aminopyralid, imazapyr, chlorsulfuron, clethodim, clopyralid, and fluazifop-p-butyl, indicate that adverse effects in invertebrates due to herbicide toxicity are unlikely. Based on available information there is no indication that adverse effects on terrestrial invertebrates would occur. As with mammals and birds, the risk characterization for terrestrial invertebrates is based on data covering very few species relative to the large number of terrestrial invertebrates that might be exposed to these chemicals. A large series of bioassays and field trials using clopyralid, among other pesticides, where used on a variety of terrestrial invertebrates. Clethodim acute toxicity is classified as practically nontoxic to honeybees. Additionally, clopyralid studies on birds, bees, spiders, and earthworms generally support the characterization of clopyralid as relatively non-toxic.

The upper bound HQs for glyphosate reach or slightly exceed one (HQ=1.8) for terrestrial invertebrates consuming small insects or vegetation. This raises concerns that moderate to high application rates of glyphosate could have an adverse impact on some terrestrial invertebrates. (It should be noted that these risk quotients were based on the more toxic formulation of glyphosate that includes a surfactant; HQs were not calculated for the less toxic aquatic formulation of glyphosate being used in this project). The available field studies on terrestrial invertebrates do not, for the most part, reinforce a concern. Most field studies suggest that effects on terrestrial invertebrates will be minimal and secondary to changes in vegetation. Furthermore, under the proposed action, only the aquatic formulation of glyphosate will be used which does **not have a premixed surfactant and is considered less toxic** than non-aquatic formulations (USDA 1997, Folmar 1979).

Similar to glyphosate, the upper bound HQs for triclopyr slightly exceed one (HQ=1.3) for terrestrial invertebrates consuming vegetation. For triclopyr, there is a reasonably extensive group of field studies indicating that effects on terrestrial invertebrates are most likely to be associated with changes in habitat and food availability rather than herbicide toxicity. The risk characterization for insects is therefore based primarily on the field studies rather than the HQs and does not indicate that adverse effects are likely. Similar to the risk characterization for mammals, only the dietary HQs approach a level of concern for terrestrial invertebrates. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as Siberian elm, tree of heaven, Russian olive, and tamarisk. Triclopyr will be applied using direct hand application and methods such as directed foliar, basal bark spray, and drizzle wick and wipe on individual plants or cut-stump application which will minimize the risk of non-target exposure and accidental drift.

Aquatic Biota

When herbicides are used near aquatic habitats the Proposed Action has elected to use aquatic formulations (approved by the Federal Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation (DPR) for use in aquatic systems), even though the project does not include herbicide application or discharge to water. These herbicides have different formulations than those used in upland plant communities and are considered safe to most aquatic organisms when label directions are followed. Only herbicides that have been registered for use in the states of

California and Nevada, would be used in this Invasive Plants Treatment Project area.

A review of risk assessments for aquatic species shows that most of the concern for aquatic species is associated with exposure scenarios for an accidental spill. These scenarios were above a threshold of concern for hazards to aquatic plants and algae. For example, clopyralid studies on aquatic species, both plants and animals, suggest that clopyralid is relatively non-toxic. For example, extremely low HQs, ranging from 0.000004 (acute exposures in tolerant fish) to 0.004 (sensitive aquatic plants) indicates no basis for asserting that effects on nontarget aquatic species are likely to occur with clethodim. Clethodim is classified as moderately toxic to aquatic invertebrates and slightly to practically non-toxic to fish. Clethodim and Fluazifop-P-butyl have no information regarding toxicity to terrestrial-phase amphibians. EPA ecological risk assessments use birds as surrogates for amphibians and reptiles. Furthermore, while no data are available on the permeability of amphibian skin to clethodim and Fluazifop-P-butyl, mammalian skin (pig) results are used as a surrogate of the structure and function of amphibian skin. Fish and frog aminopyralid toxicity studies and the worst-case exposure assessments, show no basis for suggesting that adverse effects in fish are plausible and data on leopard frog larvae conclude that amphibians are no more sensitive to aminopyralid than fish (Aminopyralid highest hazard quotient is 0.1, below the level of concern by a factor of 10).

Glyphosate was the only herbicide where an accidental spill scenario exceeded a threshold of concern for fish, amphibian, or invertebrate species. While the risk of accidental spill cannot be completely eliminated, project design features (PDF) include aquatic buffers preventing herbicide mixing and loading near water have been included in the Proposed Action, and will limit the potential for a spill to enter water and impact aquatic plants or algae. Additional PDFs requiring a project spill plan and the use of spill kits further limit potential impacts to aquatic resources if a spill were to occur. Finally, it should be noted that SERA risk assessments are likely to overestimate hazards from a spill relative to activities in the Proposed Action. Under the proposed action, only the aquatic formulation of glyphosate will be used which does not have a premixed surfactant and is considered to be virtually non-toxic to aquatic organisms (USDA 1997, Folmar 1979).

Based on the discussion above, the proposed herbicide use poses few risks to aquatic organisms; observable/palatable direct effects to amphibians are not expected and are below the threshold of concern (hazard quotient less than 1) (SERA risk assessments). It is possible that food organisms utilized by amphibians could be affected (directly or indirectly) if estimated concentrations (SERA risk assessments) were to occur. However, estimated concentrations do not consider project design features where herbicide treatments uses the lowest effective label rates and or hand application is the preferred method especially in close proximity to water. This would help mitigate potential indirect effects and therefore **any effects would be spatially isolated and of low magnitude, with fast recovery likely.**

Hazard quotients for triclopyr and chlorsulfuron were also above a threshold of concern for either chronic or acute exposure scenarios relative to effects to algae or aquatic plants (Williams 2012) however the Proposed Action does not include prescriptions for aquatic invasive species such as algae or submerged plants. Additional layers of precaution have been applied with the incorporation of Project Design Features where there are known occurrences of Endangered, Threatened or Sensitive aquatic species (see EA), National Best Management Practices (see EA appendix C) and Inyo NF standards and guidelines.

Surfactants

The Proposed Action describes use of methylated seed oil, such as Hasten or Competitor, as a surfactant that may be used with any of the herbicides. Its primary ingredient is ethylated canola oil, which is considered food grade. Polyoxyethylene dialkylester and Sorbitan alkylethoxylate ester are other active ingredients (Bakke 2007). Two carcinogenic impurities are known to be in the surfactant: ethylene oxide and 1,4 dioxane. Manufacture labels recommend using 0.25-1% surfactant mixed with the herbicide. Other than ethylated canola oil, the chemicals in the surfactant have received very little study and scrutiny to determine what affect the chemicals may have. Overall the hasten/competitor surfactant appears to have a lower level of toxicity than the herbicides and is used in small quantity compared to the herbicide, and thus appears to have little concern for wildlife, except for the uncertainty concerning some of the chemicals and carcinogen effects of the impurities in hasten/competitor.

Adjuvants such as highlight blue or colorfast purple are examples of water-soluble dye proposed for use. It is a colorant that makes the herbicide more visible during application. Actual ingredients are unknown but are identified as minimal risk inert ingredients or as inert of unknown toxicity by the EPA (Bakke, 2007). Highlight blue is considered virtually non-toxic to humans, and there is no evidence indicating toxicity to wildlife.

Herbicide Application Information

Each herbicide prescription proposed for use will be submitted to the Forest Supervisor in a Pesticide Use Proposal form for approval (PUP; FS-2100-2; FSM 2150) and will be reviewed annually. Proposed uses and implemented applications will be submitted to the respective County.

Table 1. Herbicides proposed for invasive plant treatments, including herbicide characteristics and application considerations. Additional information available from Tu et al. (2001) and DiTomaso et al. (2013).

Herbicide (Active Ingredient)	Example Trade Name	Mechanism	Selectivity	Biological timing of application	Seasonal or temperature restrictions	Soil persistence (avg. soil half-life in days)	Potential for leaching	Use permitted near water?[1]	Use permitted in grazed areas?[2]
Aminopyralid	**Milestone**	Growth regulator (auxin mimic)	Broadleaf species, particularly Asteraceae and Fabaceae	Pre- and post-emergence; For annuals, seedling stage; for perennials, when plants are fully expanded	Product should be >40°F to prevent crystalizing	35	Limited, but may leach into ground water if there are permeable soils and water table is shallow	Do not apply directly to water	Yes
Chlorsulfuron	**Telar**	Inhibits synthesis of certain amino acids	Broad spectrum, best on broadleaf	Pre- and post-emergence; Bud to bloom or fall rosette stage	None	28-42	Low as herbicide readily adsorbed to soil	Do not apply directly to water	Yes (maximum application rate applies)
Clethodim	**SelectMax**	Inhibits fatty acid synthesis	Annual and perennial grasses	Post-emergence; For annuals, seedling stage; for perennials, when plants are fully expanded	Do not apply to plants stressed by extreme high or low temperatures	3	Very low	Do not apply directly to water	Yes (delay in entry)
Clopyralid	**Transline**	Growth regulator (auxin mimic)	Broadleaf species, particularly Asteraceae and Fabaceae	Pre- and post-emergence; For annuals, seedling stage; for perennials, when plants are fully expanded	None; may require higher application rates during extreme temperatures	12-70, average 40	Moderate, particularly with shallow water tables	Do not apply directly to water	Yes
Fluazifop-P-Butyl	**Fusilade DX**	Inhibits fatty acid synthesis	Annual and perennial grasses	Post-emergence; For annuals, seedling stage; for perennials, when plants are fully expanded	Not effective in drought conditions	15	Very low	Do not apply directly to water	Yes (delay in entry)

Glyphosate	**Rodeo**	Inhibits synthesis of amino acids	Broad spectrum	Post-emergence; Rapidly growing plants	None	47, but no soil activity	Very low as herbicide has high adsorptive capacity	Can be applied in and around aquatic sites and wetlands	Yes
Imazapyr	**Arsenal, Stalker**	Inhibits synthesis of amino acids	Broad spectrum	Pre- and post-emergence; Rapidly growing plants	Late summer or fall; oils may assist in uptake during stress	25-142, depending on soil type	Low potential for leaching, but is susceptible to surface runoff, and leaching from dead roots may occur	Can be applied in and around aquatic sites	Yes (foliar treatment cannot exceed 10% of grazed area)
Triclopyr	**Garlon 3A, Garlon 4**	Growth regulator (auxin mimic)	Broadleaf and woody species	Post-emergence; Rapidly growing plants.	Potential for volatility increases with ambient temperature for ester formulation (Garlon 4)	30 (10-46)	Not considered to have high potential for ground or surface water contamination	TEA-Can be applied in aquatic sites BEE-Do not apply directly to water	Yes (foliar treatment cannot exceed 10% of grazed area)

[1] Per herbicide label directions. Labels do not specify distance in feet to water. Project specific herbicide buffers will be implemented (Table 3).

[2]Per herbicide label direction. Restrictions can vary from application rate restrictions to timing requirements, and may include delays of grazing following herbicide application.

DESIGN FEATURES

Project Design Features (PDF) define a set of conditions or requirements that an activity must meet to avoid or minimize potential effects on sensitive resources and to ensure consistency with the Forest Land Management Plan. DFs involving herbicides are an added layer of caution to the already regulated and approved use of these chemicals. DFs are not optional and application of these measures is the basis for the effects analysis for this project.

The Project DFs are based on site-specific resource conditions within the project area, including but not limited to the current invasive plant inventory, the presence of sensitive species and their habitats, proximity to water and potential for herbicide delivery to water, and the social environment. Recommended Best Management Practices from Cal-IPC (2012) were considered in the development of DFs. DFs listed are not an exhaustive list of all relevant Forest Plan Standards and Guidelines or pesticide label directions. However, project implementation will be consistent with all Forest Plan direction and will follow all herbicide label instructions. For a full list of project design features see the EA.

ANALYSIS APPROACH

Analysis Area for Direct, Indirect, and Cumulative Effects

According to the Council on Environmental Quality (CEQ) National Environmental Protection Act (NEPA) regulations, "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable (but not speculative) future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

The CEQ issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Past management and development activity has played a role in the degradation of habitats within the Inyo National Forest. Human activities within these habitats include grazing, timber harvest, fuels management, recreation, and water development. Loss or alteration of suitable breeding habitat can reduce reproductive success, which may have a profound impact when population numbers are small. The design features, implemented as part of the proposed action limit activities and the use of herbicides in occupied habitat reducing potential direct and indirect effects to wildlife species from the proposed action. Treating noxious and invasive species in these sensitive environments and using the control methods prescribed, will, over time improve the habitat by removing the threat of noxious weed infestation and expansion. The incremental short term impacts to habitat from implementation of the proposed action when combined with past actions does not result in an adverse long term loss of habitat because the long term benefits of treatment and removal of noxious and invasive weed species improves degraded habitat. Reasonably foreseeable future actions will not result in habitat degradation because they will be required to avoid adverse impacts to habitat and mitigate short-term impacts when they cannot be avoided.

Unless otherwise stated below, the analysis area to determine potential direct and indirect effects of the alternatives encompasses the entire project area, all Inyo National Forest system lands that occur in California and Nevada. The cumulative effects area for this project also includes where pertinent, adjacent public and private lands outside of its boundaries.

EFFECTS TO FOREST SENSITIVE FAUNA SPECIES

The following species life histories and existing habitat conditions are briefly described here.

GREATER SAGE GROUSE-BI STATE DISTINCT POPULATION SEGMENT

During the Annual Implementation Process this project would continue to consider management direction and emphasize management actions that are consistent with the "Bi-State Action Plan: Past, Present, and Future Actions for the Conservation of the Greater Sage-Grouse, Bi-State Distinct Population Segment" and "Inyo National Forests Sage-Grouse Interim Management Policy" (USDA Forest Service 2012c).

Potential for Occurrence: Population Management Units (PMUs) are areas delineated around sub-populations of sage-grouse. Part or all of the following PMUs are contained within the INF: Bodie, South Mono and White Mountains.

Threats: Threats to this species that may occur on the INF are taken from the Bi-State Conservation Plan that identifies several risk factors as having either a "High" "Moderate" or "Low" potential for negatively affecting sage grouse within each of the PMUs. While each PMU has unique risk factors, some commonalities, including risk of wildfire, pinyon juniper encroachment and invasive species occur across several of the PMUs.

Environmental Consequences

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Within sage grouse habitat, weed crews and their equipment could temporarily displace individual sage grouse while weed treatment efforts were being conducted. However, disturbance would be temporary, generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season; therefore there would be no long term impacts. Limiting operating periods would avoid active nesting/lekking areas until after the critical disturbance period for sage grouse. Herbicide treatments for cheatgrass are generally applied as a pre-emergent during the fall which provides flexibility to avoid the critical disturbance period for sage grouse. Herbicides used to control annual grasses, including imazapyr are generally used as a pre-emergent that are applied during the fall months. Non-native thistles and knapweeds would either be hand pulled or treated with an herbicide such as aminopyralid or clopyralid. The ecological effects of the above herbicides as well as others proposed are discussed in the Herbicide Toxicity section above. In summary, there are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for granivorous birds, such as the sage grouse. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. **Triclopyr** was the only chemical that HQs exceeded the level of **concern (HQ > 1)** for exposures to birds involving the consumption of contaminated vegetation. **However, the HQs are based on worst case scenario exposures and do not account for factors such as timing and method of application, animal behavior and feeding strategies and/or implementation of project design criteria**. This chemical is used in targeted situations of invasive species (salt cedar, etc.) unlikely to occur in or near active nesting/lekking areas.

There will be no long term negative impacts to sage grouse habitat under the proposed action from manual or herbicide treatments. From a habitat and forage perspective, sagebrush, forbs (especially those in the composite family), and grasses are important to sage-grouse. Perennial grasses are largely

unaffected by herbicides such as clethodim and fluazifop-P-butyl which when used to control annual grasses are applied prior to perennial grass emergence. The use of pre-emergent herbicides to control annual grasses such as cheatgrass is recommended as a sage-grouse habitat management guideline (Connelly et al. 2000). Areas that are treated manually will likely revegetate within the same growing season or by the following year. Effects to non-target plant species from pre-emergent fall treatment of cheatgrass will be minimal due to the timing of the application and the grass-specific herbicides that will be used. Over the long term, control and eradication of invasive species such as cheatgrass in Bi-State sage grouse habitat will help maintain quality habitat for this species.

Insects: There is no known insect or pathogen that is effective in reducing cheatgrass infestations. Other noxious weeds such as thistles can occasionally occur in some portions of sage grouse habitat, for which the use of insects could be effective. If biological controls were used, they pose little threat to sage grouse habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and Nevada Department of Agriculture (NDA) will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

Some short term impacts to sage grouse habitat may result from treatments while native plant communities recover. However, impacts would be minor as it is unlikely that sage grouse would be utilizing these type converted areas that no longer contain habitat for Bi-state sage grouse. Recovery period could take potentially up to five years for reestablishment of native grasses and re-sprouting of sagebrush. Over the long term habitat conditions would be improved and restored by removing non-native grasses and allowing for sagebrush stands to recover.

Cumulative Impacts: For the purpose of this analysis, cumulative impacts include those that have been identified in the Bi-State Conservation Plan as High Risk factors for sage grouse within these three PMUs (Bi-State Plan 2012). Impacts that are expected to occur within the next ten years within suitable habitat within the analysis area will be addressed. Ten years is assumed to be an adequate timeframe to gauge how stochastic or longer term events may be affecting population trends.

Within the last decade, wildfire has burned thousands of acres of Bi State sage grouse habitat within many of the PMUs. On INF, Clark Fire burned August 2016 a total of 2018 acres within the Long Valley population and the Grant Fire burned August 2017 a total of 400 acre within the Parker population. Cheatgrass and other invasive species are present in some of these burned areas; however, post fire restoration efforts, such as seeding and active weed management have helped in some areas with native plant restoration. To reduce the threat of future high intensity fires and/to improve habitat for sage grouse, the BLM, the Forest Service and other local agencies have completed or are in the process of completing multiple fuels reduction projects and habitat restoration projects in or near important breeding habitat within the Bodie and South Mono PMUs (Bi-State Plan 2012).

Determination

Project Design Feature Specific to Bi-state Sage Grouse

Invasive plant treatments will be avoided in sage-grouse habitat during the breeding (March 1 –

May 1) and nesting (May 1 – June 15) seasons (INF Sage-Grouse Interim Management Policy, 2012). Site-specific exceptions may be allowed if reviewed and approved by the Forest or District Wildlife Biologist.

Under the proposed action, treatment of invasive species such as new infestations and/or leading edge of cheatgrass will also help reduce the fuel loading in sagebrush habitat as well as reduce the threat of increased infestations following a wildfire.

The effects from the proposed action would not incrementally result in negative impacts to the Bi-State sage grouse when considered along with the effects of past, present and reasonably foreseeable actions. Therefore, it is my determination that the proposed action **may impact individual** Bi-State sage-grouse **but will not result in a trend toward federal listing or a loss of viability.**

BALD EAGLE, GREAT GRAY OWL, NORTHERN GOSHAWK, CALIFORNIA SPOTTED OWL

Bald eagle, great gray owls, goshawks and spotted owls on the INF are found in late seral forested habitats, mixed conifer and upper montane forest ecological zone which consist of red fir forest, Jeffrey pine forest, and lodgepole pine, intermixed with meadows. These carnivorous predators typically hunt from perches and on the wing. Bald eagles are closely associated with lake areas to fish and hunt waterfowl, and rely on prey that are dead, dying or otherwise vulnerable rabbits, and reptiles. Owls and goshawks forage over large areas consuming prey items such as squirrels, small birds, woodrats, mice, gophers and voles.

In addition to project design features outlined for this project, existing standards and guidelines will continue to be considered such as:

- **California spotted owl provides for 300-acre protected activity centers designated around territorial locations and intended to provide sufficient habitat to support nesting owls.**
- **Great gray owls protected activity center and standards and guidelines that provide for follow-up surveys, a limited operating period during the breeding season, and maintenance of herbaceous vegetation.**

Potential for Occurrence: All these species are sensitive to disturbance and human presence. On INF, no nest detections occur for great gray owl, two spotted owl PAC occur at the Kern Plateau, three bald eagle nest observed on the forest since 2004 in the Upper Owens River and June Lake areas and 38 goshawk territories exist throughout INF.

Threats: Threats to this species that may occur on the INF include:

- Habitat loss and degradation
- Large-scale stand replacement wildfires and fire suppression
- Habitat fragmentation from fires and forestry practices
- Human disturbance

Environmental Consequences

Direct and Indirect Impacts

Manual and Herbicide Treatments: Weed treatment occurring within buffer of PAC, territories or active nest could result in some disturbance to roosting, foraging, or nesting birds. The risk of disturbance is low because typically one or two individuals implement invasive plant treatments. Human disturbance during non-nesting from weed treatments may cause these species to be displaced or disrupt foraging activities.

However, this disturbance would be temporary, weed crews would generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season; therefore there would be no long term impacts to the viability of individuals or the population. There will be no direct or indirect impact to these species from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for carnivorous birds, such as the goshawks and owls. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. Chronic exposures are also unlikely because prey are not known to prefer foraging on invasive plant species. This reduces the likelihood of chronic exposure since treatments are focused on the invasive plants and prey species are unlikely to consume these plants.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to bald eagle, great gray owls, goshawks and spotted owls or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS, NDA and CDFA these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

The use of biological controls in suitable habitat for Bald eagle, great gray owls, goshawks and spotted owls is expected to have nominal effects because insects are not a primary contributor to the diet of these species. Release of biocontrol insects may result in brief noise disturbance causing individuals to be flushed from the site and avoid the area temporarily. However the disturbance in a given treatment area would typically last for only a few hours with a brief revisit in the same growing season; therefore effects would be very short-term and not cause any long term impacts to the species.

There will be no negative impacts to habitat for bald eagle, great gray owls, goshawks and spotted owls under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for this species. Over the long term, control and eradication of noxious weeds in bald eagle, great gray owls, goshawks and spotted owls habitat will help maintain quality habitat for these species.

Cumulative Impacts: For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted the nesting areas within the project area in the past, present or foreseeable future. The largest threat to bald eagles, great gray owls, goshawks and spotted owls is loss of late seral conifer and meadow habitat. Densely forested stands that are composed of mixed age trees with multiple canopy layers are important. Ongoing INF fuels reduction projects in or near suitable habitat has likely resulted in some disturbance to individuals, and in some areas resulted in a reduced or enhanced availability of quality habitat.
Treatment of noxious weeds will over the long term help protect and maintain habitat quality for these species. This project provides rapid response to eliminate and control weeds that could prevent infestations from expanding and adversely affecting native plant communities. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the foraging

availability by diminishing habitat quality for prey.

Determination

Under the proposed action, there may be minor short-term impacts to bald eagles, great gray owls, goshawks and spotted owls due to disturbance during treatment activities. Therefore, it is my determination that the proposed action **may impact individual** bald eagles, great gray owls, goshawks and spotted owls **but will not result in a trend toward federal listing or a loss of viability.**

WILLOW FLYCATCHER

Willow flycatcher sites range in elevation from 1,200 to 9,500 feet, though most (88 percent, 119 of 135) are located between 4,000 and 8,000 feet (Stefani et al. 2001). Willow flycatchers are closely associated with meadows that have high water tables in the late spring and early summer, and abundant shrubby, deciduous vegetation (especially *Salix* spp.). Shrubs in these preferred habitats are typically 6.5 to 13 feet in height, with the lower half comprised of dense woody stems.

However, the flycatchers in the lower Rush Creek area below Mono Lake occur in a-typical habitat, at roughly 6,500 feet above sea level within a matrix of Great Basin big sagebrush scrub. Willow flycatchers on Rush Creek display preferences for high Wood's rose (Rosa woodsii) cover, lower (but still significant) willow cover, and low sagebrush scrub-associated species cover at the territory scale. Through 2010, 118 out of 188 located nests were built in Wood's rose (McCreedy 2011). Contrary to other reports in California, willow flycatchers at lower Rush Creek do not display any significant preference for the presence of surface water. Breeding territories averaged 59 meters from water.

Potential for Occurrence: Inyo NF has a total of 32 active flycatcher sites (2,238 acres), constituting 7% of all currently used flycatcher habitat in the Sierra Nevada (N= 285 sites, 33,367 acres total). Individuals occur on all four ranger districts, with the majority northwest of the Mammoth Lake area (Mammoth Lake and Mono RDs). However there are currently no known active nests.

Threats: on the INF may include:

- Habitat loss and degradation of meadows
- Large-scale riparian replacement wildfires
- Water diversions, grazing, and encroachment
- Human disturbance

Environmental Consequences

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Under the proposed action there will be no measureable impacts to willow flycatchers from the use of manual or herbicide treatments. Potential effects of invasive plant treatment methods on willow flycatchers include primarily disturbance that may occur during the nesting season, in breeding habitat which consists of riparian stringers and meadow habitats at least 10 acres in size with saturated soils and dense shrubs (Green et al. 2013). The direct effects from invasive plant treatment could include disturbance caused by noise, people and vehicles. Human and vehicle presence can cause birds to leave nests. Given there are no known nest sites within the project area (on NFS lands), the likelihood of disturbance during implementation is considered to be

very low.

Herbicide Toxicity SERA risk assessments and project worksheets have been reviewed. There are no acute or chronic exposure scenarios specific to flycatchers but application rates described in the Proposed Action according to SERA will result in a Hazard Quotient (HQ) above one for a large fish-eating bird such as the bald eagle. Herbicides and surfactants applied as described in the Proposed Action pose no known risks to willow flycatchers.

Insects: The release of biological controls pose no risk to willow flycatchers or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and NDA will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

All methods would generally last less than one day and only a few hours potentially revisiting a site once or twice in the same growing season which is a low risk of concern for disturbance to individuals.

Determination

Based on the above assessment, the Proposed Action may temporary disturbance individual willow fly catcher but disturbance will not occur during or in proximity to nesting willow fly catcher. Invasive plant treatments will not result in the alteration of willow fly catcher habitat. Therefore, the project will not lead to a trend toward federal listing or loss of viability of willow fly catcher populations.

CALIFORNIA GOLDEN TROUT

The California golden trout is an endemic fish species, limited to a small portion of suitable habitat on the Inyo National Forest. The California golden trout is native to Golden Trout Creek and the South Fork Kern River in the upper Kern River basin (Moyle 2002).

During the Annual Implementation Process for this project would continue to consider management direction and emphasize management actions from current plans such as:

- Golden Trout Wilderness Plan
- California golden trout conservation assessment and strategy
- Golden Trout/Volcano Creeks critical aquatic refuge

Potential for Occurrence: California golden trout is restricted in range to two headwater stream systems in the upper Kern River and are endemic to the South Fork of the Kern River and Golden Trout Creek both located in an area referred to as the Kern Plateau in the Golden Trout Wilderness on INF.

Threats: Threats to this species that may occur on the INF

- Hybridization & Predation
- Grazing
- Recreation

Environmental Consequences:
Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Weed treatments adjacent to water would adhere to all label directions as well as project design features including buffers. Human disturbance from weed treatments (including hand pulling) may encounter individuals and cause fish to be disperse. However, this disturbance would be temporary, generally lasting only the day and generally only a few hours potentially revisiting a site once or twice in the same growing season that would not result in any measurable impacts to the viability of individuals or the population. Herbicides used to control annual grasses, including clopyralid are used as a pre-emergent that are applied during the fall months. Non-native thistles and knapweeds would either be hand pulled or treated with an herbicide such as aminopyralid or clopyralid. The ecological effects of herbicide use were previously discussed in the Herbicide Toxicity section. There will be no direct or indirect impacts to golden trout from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for fish.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to trout or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and NDA will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

It is unlikely biological controls would be used in these habitats due to the remoteness of the known locations as well as the relatively small occurrences of currently known infestations within habitat for this species. Existing standards and guidelines to protect aquatic systems would be implemented to avoided disturbance for the golden trout. However the disturbance would be short term (less than one day and generally only a few hours potentially revisiting a site once or twice in the same growing season) and not cause any long term impacts to the species.

There will be no negative impacts to habitat for golden trout under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact this species. Over the long term, control and eradication of noxious weeds will help maintain quality habitat for California golden trout.

Cumulative Impacts: For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted California golden trout within the project area in the past, present or foreseeable future. The largest threat to California golden trout is hybridization and predation by brown trout. The species has limited distribution based on genetic stock and is managed by natural and artificial barriers therefore they are also highly susceptible to stochastic events such as flash floods, and drying conditions which may become more frequent with climate change.
Rapidly responding to eliminate and control new weed occurrences throughout the South Fork Kern River and Golden Trout Creek, will assure that infestations do not get larger and that native plant

communities are protected. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the prey base, affect microclimate conditions, and change hydrology that may diminishing habitat quality for California golden trout.

Determination

Under the proposed action, there may be minor impacts to California golden trout due to disturbance during treatment activities when removing weeds along riparian and steam banks in the Golden Trout Wilderness. There would also be a beneficial effect of maintaining native wildflowers and perennial grasses that provide shade, pollinators, and bank cover that trout depend on. Therefore, it is my determination that the proposed action **may impact individual California golden trout but will not result in a trend toward federal listing or a loss of viability.**

AMPHIBIANS: BLACK TOAD & INYO MOUNTAIN SALAMANDER

These two amphibians have restricted niches and are endemic to mountain ranges between White Mountain and Inyo Mountain. Both species are closely associated with seeps, streams, and springs. The black toad range is limited to Deep Springs Valley where the saltpan and surrounding playa cover an area of about 5 square miles. Most historic locations occur on BLM off the forest boundary in Deep Springs Valley. Isolated springs in largely desert and desert scrub habitat are key habitat elements for Inyo salamander and occur exclusively in desert ecosystems with habitat restricted to the Inyo Mountains between Waucoba Mountain and New York Butte. Salamanders tend to occupy "seeps", a type of spring that does not form a channel or pool.

During the Annual Implementation Process for this project would continue to consider management direction and emphasize management actions such as:

- direction that applies to riparian conservation areas, the buffer area around streams, rivers, lakes, meadows, bogs, and other wetland types, applies to the critical aquatic refuges.
- direction for an aquatic management strategy with desired conditions, goals, and a set of standards and guidelines organized around a set of riparian conservation objectives that includes delineation of riparian conservation areas around streams, rivers, lakes, meadows and a variety of other wetland types, and a set of critical aquatic refuges.

Potential for Occurrence: On the INF 16 isolated and remote locations are known for the Inyo Mountains Salamander within the Inyo Mountains. Six records for black toads are associated with two springs on the Inyo NF (Sam's Spring and an unnamed spring in Birch Creek).

Threats: Threats to this species that may occur on the INF include:

- stochastic events such as flash floods
- climate change that results in drying conditions

Environmental Consequences:

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: These species spend most the year underground but seasonally during spring or storm events that create suitable microclimates they surface

above ground. Toads will disperse and migrate across landscapes during these wet weather events which is a restriction period for herbicide application. Weed treatments would be unlikely to occur when individuals are on the ground surface because of the wet-weather restrictions on herbicide application. Herbicide would follow all label directions and project design features including #5) "Herbicide application will be carefully evaluated following precipitation and/or when runoff, soil saturation, standing water, or heavy dew is present or expected, to ensure the application will not result in herbicide entering surface or groundwater. Application will occur only under favorable weather conditions, generally defined as: 30% or less chance of precipitation on the day of application based upon NOAA weather forecasting, rain does not appear likely at the time of application, and if rain is predicted with 48 hours, the amount does not exceed a ¼ inch."

Human disturbance from weed treatments (including hand pulling) may result in encounters with individual toads and salamanders and cause them to be disperse. However, this disturbance would be temporary, weed crews would generally only be in a given treatment area for a day and for a few hours potentially revisiting a site once or twice in the same growing season. Because of this limited temporal impact this would not result in any measurable impacts to the viability of individuals or the population.

There will be no direct or indirect impacts to these two amphibians from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. Salt cedar tamarisk has been previously treated at black toad springs habitat using Triclopyr to treat woody species. Triclopyr can be sprayed on foliage but when used to treat woody species such as tamarisk it is typically applied using hand application of herbicide to cut-stumps. Hand application methods minimize the risk of non-target exposure and accidental drift. Based on the SERA risk assessments there will be no direct or indirect impacts to the black toad or Inyo Mountains salamander from the use of herbicides.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to trout or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS, NDA and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

Existing standards and guidelines exist to protect aquatic systems in treatment sites to avoided critical breeding periods for these amphibians. Any disturbance would be short term and not cause any long term impacts to the species.

There will be no negative impacts to habitat for amphibians under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact this species. Over the long term, control and eradication of noxious weeds will help maintain quality habitat for black toads and Inyo Mountain salamanders.

Cumulative Impacts: For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted black toads or Inyo salamanders within the project area in the past, present or foreseeable future. The largest threat to black toads or Inyo salamanders is loss of hydrologic

function. Both of these species rely on clean reliable water sources. As a result of these species limited distribution, their habitat is highly susceptible to stochastic events such as flash floods, and drying conditions which may become more frequent with climate change.

Any activities that disrupt water flow (e.g. water diversions/dams, in-stream mining, stream capping, feral livestock (burros and cattle), upstream water pumping) and climate change and related stochastic events like flooding or drought are risk factors. Persistence of these salamander and toad populations may be closely tied to climate variations, especially if habitats experience extreme drying trends, or stochastic events such as flash floods. Tamarisk requires a lot of water to survive and can directly change hydrology and negatively impact amphibian habitat. Therefore, treatment of noxious weeds, particularly tamarisk, in habitat for these species will over the long term help protect and maintain habitat quality for these species, especially by increasing water availability. Rapid response to eliminate and control new weed occurrences, will assure that infestations do not get larger and that native plant communities are protected. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the hydrology and diminish habitat quality for black toads and Inyo Mountain salamanders.

Determination

Under the proposed action, there may be minor impacts to black toads and Inyo Mountain salamanders due to disturbance during treatment activities. Removing tamarisk at known locations can be beneficial due to the amount of water consumption tamarisk requires. Implementation has a low likelihood of disturbing individuals due to their limited temporal and spatial occurrence for surface activity. Therefore, it is my determination that the proposed action **may impact individual black toads and Inyo Mountain salamanders but will not result in a trend toward federal listing or a loss of viability.**

SPRINGSNAILS: WONG'S & OWENS VALLEY

Both springsnails are very closely associated with springs with relatively high conductivity water supplied by the Owens Valley aquifer (USGS 1998). Presence of springsnails at springs are thought to be indicators of perennial water of high water quality. The Owens Valley springsnail is known from ten localities, including two localities on the INF found along escarpments of the White and Inyo Mountains on the east side of the Owens Valley. Wong's is known from six localities in the Owens Valley along the eastern escarpment and has a larger geographic range than the Owens Valley springsnail. It ranges from Pine Creek south to Little Lake, and along the eastern side of the valley from French Spring to Marble Creek in the Inyo Mountains. It is also found in a few sites in Long, Adobe, and Deep Springs Valleys.

During the Annual Implementation Process for this project would continue to consider management direction and emphasize management actions such as:

- Critical Aquatic Refuges direction that applies to riparian conservation areas, the buffer area around streams, rivers, lakes, meadows, bogs, and other wetland types

Potential for Occurrence: Habitat for this species includes seeps and spring-fed streams of small to moderate size. Temperature requirements range from 49.1 to 71.6 degrees Fahrenheit. The snails are typically found in watercress (Rorippa) and/or on small bits of travertine and stone (Hershler 1989) and are only known to occur in flowing water. Spring habitat that has previously been altered by spring-improvements, grazing or other impacts would alter the water quality of the spring and would preclude occurrence of these species. Each population of snail is endemic to the spring it inhabits, and since these snails are obligatory aquatic throughout their entire life, they cannot disperse to other springs, nor can springs where snails have been extirpated be re-colonized. Spring

surveys are ongoing and only one location has both species co-occurring (Batchelder Springs at Toll House).

Threats: Threats to this species that may occur on the INF include:

- grazing or water diversions may degrade or eliminate the habitat
- climate change that results in drying conditions
- hydrological changes in water table and aquafers

Environmental Consequences:

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatment: These species are fully aquatic and occur in cold clean waters near springs. Weed treatment will not occur in water and disturbance during implementation around water would be temporary because weed crews would generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season. This activity would not result in any measurable impacts to the viability of individuals or the population.

Herbicide application would adhere to all label direction and follow project design features including #5) "Herbicide application will be carefully evaluated following precipitation and/or when runoff, soil saturation, standing water, or heavy dew is present or expected, to ensure the application will not result in herbicide entering surface or groundwater. Application will occur only under favorable weather conditions, generally defined as: 30% or less chance of precipitation on the day of application based upon NOAA weather forecasting, rain does not appear likely at the time of application, and if rain is predicted with 48 hours, the amount does not exceed a ¼ inch."

There will be no direct or indirect impacts to spring snails from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these springsnail species.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to black toads or Inyo salamanders or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and NDA will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

There will be no negative impacts to habitat for springsnails under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for either of this species. Over the long term, control and eradication of noxious weeds will help maintain quality habitat for springsnails.

Cumulative Impacts: For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted these springsnails within the project area in the past, present or foreseeable future. The largest threat to springsnails is loss or change of hydrologic function. Both of these species rely on clean reliable water sources. As a result of these species limited distribution, their habitat is highly susceptible to stochastic events such as flash floods, and drying conditions which may become more frequent with climate change. If left untreated, particularly with invasive species that

negatively impact water availability and aquatic systems, expansion of invasive species could diminish habitat quality over time.

Determination

Under the proposed action, the likelihood of effects to springsnails due to disturbance when implementing treatment activities is low because the species is aquatic and proposed treatments are terrestrial. Therefore, it is my determination that the proposed action **may impact individual Wong's and Owen Valley Springsnails but will not result in a trend toward federal listing or a loss of viability.**

BUTTERFLIES: APACHE FRITILLARY, BOISDUVAL'S BLUE & MONO LAKE

Butterflies inhabit virtually every part of an ecosystem largely determined by their dispersal ability, feeding and reproductive habits. However, these butterflies are highly endemic, meaning populations occur only in localized areas and those areas are extremely rare. Habitat suitability for many species depends on microsite conditions that can vary with each life stage. It is worth noting that insecticides, not herbicides, have been implicated in the loss of honeybees and possibly other pollinators. The Proposed Action does not include insecticides and their effects is not discussed in this biological evaluation.

Potential for Occurrence: Habitat for these butterflies include riparian areas, perennially wet marshes, wet meadows near springs, seeps, and riparian areas. The presence of both host and nectar plants is usually a critical requirement, and may limit populations to the boundary of such habitats. For some species, the majority of life stages are limited to one or a few plants for larval, juvenile or pupa, and adult stages. Currently known important host and nectar plants for these three butterflies include Leconte violet (Viola nephrophylla), bull thistle (Cirsium vulgare) and lavender thistle (Cirsium neomexicanum).

Threats: Threats to this species that may occur on the INF include:

- meadow and riparian loss and degradation
- grazing or water diversions may degrade or eliminate the host and larvae habitat
- human disturbance
- climate change that results in drying conditions
- invasive species (e.g. cheatgrass) and pesticide applications that inadvertently impact host plant species

Environmental Consequences

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Leconte violet and lavender thistle are uncommon native species occurring on the INF. Although the butterflies will use bull thistle as a host plant it is also a non-native invasive plant; however, it is listed under treatment strategy 3 to "contain," so treatment extent is expected to be limited. Furthermore there are other common native thistle species within the project area that also provide habitat for these butterflies and other pollinators, such as the western and elk thistles. Landscapes that support these plants are important to other pollinators. Herbicides and surfactants applied as described in the proposed action pose no risk to these butterflies. As reviewed in the SERA risk assessments (2007; 2011; 2014a), potential risks to insects are studied using toxicity data on the honeybee as a surrogate species. Aminopyralid would be the preferred herbicide on Canada thistle and knapweed, two species which commonly occur in meadows. This herbicide is very non-toxic, and the effective timing for use is when target plants are from the rosette to beginning of bolt stages, which are prior to flowering. Given the non-toxic nature of this herbicide, and the effective timing being prior to flowering, there would be no concern of toxicity to pollinators.

Published field studies indicate that applications of fluazifop-p-butyl used to enhance the growth of wildflowers can be beneficial to both bees and butterflies (SERA 2014a).

In summary, there are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for terrestrial invertebrates, such as the butterflies. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. Triclopyr was the only chemical that HQs exceeded the level of **concern (HQ > 1)** but this chemical is used in targeted situations of invasive species (salt cedar, etc) unlikely to affect butterflies. There will be no long term negative impacts to butterfly habitat under the proposed action from manual or herbicide treatments. As mentioned above, herbicides will be carefully selected when conducting treatments within butterfly habitat to reduce the potential for inadvertent damage or mortality to host and nectar native plant communities. Areas that are treated manually will likely revegetate within the same growing season or by the following year. Over the long term, control and eradication of invasive species in butterfly habitat will help maintain quality habitat for these species and benefit other pollinators

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to these butterflies or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and NDA will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

Cumulative Impacts: These species of butterflies are known from very few locations on the INF and their host and larvae plants are fairly uncommon as well. Loss of suitable host and larvae plant habitat from wildfires and invasion of non-native annual grasses are a concern for all pollinators**.** After wildfires invasive species are present in some burned areas; however, post fire restoration efforts, such as seeding and active weed management have helped with native plant restoration. Under the proposed action, treatment of invasive species such as cheatgrass will also help reduce the fuel loading in suitable habitat as well as reduce the threat of increased infestations following a wildfire. The effects from the proposed action would not incrementally result in negative impacts but potentially improve floral resources of native plants on INF lands for these butterflies and other pollinators when considered along with the effects of past, present and reasonably foreseeable actions.

Determination

Based on the above analysis, it is my determination the proposed action may impact individuals but will not lead to a trend toward federal listing or a loss of viability. Implementation has a low likelihood of disturbing individuals due to their limited temporal and spatial occurrence and the lack of effects to native host species and habitat. Therefore, it is my determination that the proposed action may impact individual butterflies but will not result in a trend toward federal listing or a loss of viability.

MESOCARNIVOURS: AMERICAN MARTEN, PACIFIC FISHER & SIERRA NEVADA RED FOX (SIERRA NEVADA DPS)

American marten and pacific fisher are known to occur on the Inyo NF and the red fox is presumed to occur on the Inyo NF (2017 camera photos detected it 0.25 miles from the Sierra crest just outside the

INF boundary). The ecological conditions for these species can be found in the mixed conifer and upper montane forest ecological zone in general, in proximity to meadows, riparian, and shrubfields above 5,000'.

During the Annual Implementation Process for this project would continue to consider management direction and emphasize management actions such as:

- establishing Pacific fisher 700 acre den site buffers around verified birthing and kit rearing dens with limited operating periods, minimizing fuels treatments to the extent possible and mitigating other disturbances.
- establishing American marten 100 acre den site buffers around den sites and minimizing disturbance and activities near den sites.

Potential for Occurrence in the Analysis Area: Marten locations (12) have been observed almost exclusively west of Highway 395 predominantly near Mammoth Lakes (Mammoth and Mono Lake RDs) and on the Kern Plateau adjacent to the Sierra NF (Mount Whitney RD). Pacific fisher have been identified on the forest, but limited to four different survey stations in the southern portion of the forest on the Kern Plateau. No den locations have been located on the forest

Threats: Threats to this species that may occur on the INF include:

- Large-scale stand replacement wildfires
- Climate change

Environmental Consequences:

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Direct effects from manual and herbicide treatment methods include disturbance to marten, fox and fishers from human activity. Marten, fox and fishers may flush from a treatment site and avoid the area while activities are occurring. However, weed crews would generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season; therefore there would be no long term impacts to marten, fox and fishers

Under the proposed action there will be no measurable effect to marten, fox and fishers from the use of herbicides to treat noxious and invasive species. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for large canids such as SNRF. The HQ for a canid consuming small mammals contaminated by direct spray is below one for all herbicides in the Proposed Action.

Manual and herbicide treatments will result in some minor ground disturbance but will have no long term effect on soils and other native vegetation important to marten or fisher.

There will be no negative impacts to habitat for fox, martens and fishers under the proposed action. The treatment of invasive weeds will result in negligible impacts on any life requisites for either of these species. Over the long term, control and eradication of noxious weeds will help maintain quality habitat for prey species.

Cumulative Impacts: Current and foreseeable actions that potentially impact martens and fishers include projects such as fuels reduction and ongoing activities such as public snowmobiling, snow skiing, and

recreational use of hiking trails. It is not known how these disturbances are currently impacting martens and fishers. The proposed project will not result in any measurable additional impacts from disturbance to the species or its habitat. Some minor, short term disturbance to marten, fox and fishers may occur during treatment activities but over the long term, maintaining native plant communities will benefit the fox, American martens, and Pacific fishers. The effects from the proposed action would not incrementally result in negative impacts to the fox, American martens and Pacific fishers when considered along with the effects of past, present and reasonably foreseeable actions.

Determination

Based on the above analysis, it is my determination the proposed action may impact individual American martens, red fox (DPS) and Pacific fishers but will not lead to a trend toward federal listing or a loss of viability.

BATS: TOWNSEND BIG-EARED, PALLID, WESTERN RED & FRINGED MYOTIS

Owens Valley and Eastern Sierra Nevada landscapes are thought to provide for summer and winter roosting habitat for bats as detections are well distributed across the INF. Limestone and dolomite formations, mines, and caves provide suitable habitat. Hibernating habitats vary by species and elevation, and can be limited to mines within Casa Diablo Mountain over 10,460' elevation for Townsend's bats.

Potential for Occurrence: Potential habitat for Townsend big-eared, pallid bat, western red bat, and fringed myotis within the project area, includes caves, mines, open meadows, cliffs, snags, pastures, dry forests and open water sources. There is year round use by bats on the INF except few detections are known of the pallid bat.

Threats: Threats to this species that may occur on the INF include:

- Habitat loss due to fires and forestry practices
- Potential pathogenic fungus (white-nose syndrome fungus)
- Loss or modification of habitat (including snags, bridges, buildings, etc.)
- Closure or renewed activity at abandoned mines and caves
- Human disturbance
- Pesticides (insecticides)

Environmental Consequences

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments There will be no measurable impacts to Townsend big-eared, pallid bat, western red bat, or fringed myotis from the use of manual or herbicide treatments. The primary roosting sites for these bats includes areas that are not subject to noxious weed infestations including caves, mines, and rock cliffs. Although some do occasionally roost in bark or in cavities of conifer stands, these areas are very unlikely to be affected by noxious weed treatments. Potential foraging habitat for these species such as riparian areas and meadows are prone to some level of noxious weed infestations. However, because these bat species are nocturnal foragers, weed treatment activities, which occur during the day, would not result in any disturbance to foraging bats.

Using proposed application methods for this project, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no- observable adverse effect level) for all herbicides. There are no acute exposure scenarios at application rates described in the Proposed Action that will result in a HQ >1 for a small mammal consuming contaminated insects. The likelihood of a chronic exposure to contaminated insects is remote, given the small acreages treated and the relatively large areas in which

bats forage. The bats are not likely to forage exclusively within treated areas over a 90- day period (the chronic exposure) so there does not appear to be a plausible risk from chronic exposure.

If weed infestations became large enough and contiguous enough, they may be treated using mechanical, biological and chemical treatment methods. Insect populations would likely be reduced in infested areas due to the lack of native plant biodiversity. Non-native plants can reduce the diversity of insect populations, even where the non-native plants are closely related to the native plants (Science Daily 2015). Therefore, although some short term (one growing season) reductions in bat forage (insect populations) may occur in these localized areas, the restoration of native plant communities will help improve insect populations over the long term. In addition, treatment activities would not be occurring near or in typical Inyo NF (mines, buildings, rock) roosting sites for bats and would occur during daylight hours when bats would not be foraging and therefore there will be no direct impacts from these activities.

Cumulative Impacts: Alteration to important foraging habitat is considered to be one of the largest threats to bats. In addition, insecticides use in some parts of the country is believed to have resulted in some local reductions in populations (Pierson and Rainey 1998). This project does not include the use of any insecticides. Under the Proposed Action, foraging habitat for Townsend big-eared, pallid bat, western red bat, and fringed myotis will be improved due to the reduction of noxious weeds resulting in more viable and productive native plant communities. In addition, under the proposed action, the use of herbicides will not have any measureable cumulative impacts on Townsend big-eared, pallid bat, western red bat, and fringed myotis or their prey (insects). The effects from the proposed action would not incrementally result in negative impacts to Townsend big-eared, pallid bat, western red bat, or fringed myotis when considered along with the effects of past, present and reasonably foreseeable actions.

Determination

Based on the above analysis it is my determination the proposed action may impact individual Townsend big-eared, pallid bat, western red bat, or fringed myotis from temporary reductions in insect populations from mechanical and mowing activities, but impacts will be minor, short term and will not lead to a trend toward federal listing or a loss of viability.

PYGMY RABBIT

Pygmy rabbit are the only species in Brachylagus and are restricted to the Great Basin of the western United States. They are known to exist in isolated populations of northeastern California, southern Idaho, southwestern Montana, northern Nevada, eastern Oregon, western Utah, western Wyoming, and southeastern Washington. The southeastern boundary extends into southwestern Utah. Central Nevada and eastern California provide the southern and western boundaries (USDI 2005).

The historic range of the pygmy rabbit encompassed 100 million acres or more of sagebrush habitat in the Great Basin and Intermountain West. Currently populations exist in portions of 7 to 8 million acres (petition for federal listing, USDI 2005), of their historic 100 million. The elevational range of pygmy rabbits' current distribution is narrow. In Nevada they are found from 4,500 to about 7,000 feet and in California a much narrower range of, 5,000 to 5,300 feet (Tesky 1994).

Literature indicates that pygmy rabbits were never evenly distributed across their range (USDI 2005). In California pygmy rabbit has been noted within the Bodie area of Mono County, and in Modoc and Lassen Counties (190 miles to the northwest) (Jones 1957). Pygmy rabbit has also been documented in the Crowley

Lake area of Mono County (Jones 1957). The California Natural Diversity Database (CNDDB) lists occurrences of pygmy rabbit on the Inyo National Forest between highway 167 and Mono Lake. Occurrences are also noted within a mile of the Inyo NF on both sides of highway 395 in Pumice Valley southwest of Mono Lake. No documented sightings are known from any other Forest within California (CNDDB 2012, NRIS 2012).

The 2005 petition for federal listing (USDI 2005) was denied in 2010, but noted a wide range of pygmy rabbit population densities across their range.

The winter diet of pygmy rabbits is comprised of up to 99 percent sagebrush (Duszynski 2005, Wilde 1978, Green and Flinders 1980).

Potential for Occurrence: In the Mono Lake area, the rabbits are found in soils that have a higher sand content than populations found in Nevada. They are often found in "loamier" inclusions in stabilized sand dunes. Also, the rabbits in the Bodie area live at very high elevations of at least 8,400 feet. These loamy soils support relatively low sagebrush of about 2 to 3 feet tall (Beauvais et al. 2012).

Threats: Threats to this species that may occur on the INF include:

- Loss and degradation of habitat
- Invasive species
- Potential impacts from wild horses and wildfire management

Environmental Consequences

Direct and Indirect Impacts

Manual, Mechanical, Cultural, and Herbicide Treatments: Weed treatments conducted by hand would involve weed crews digging individual plants or cutting and bagging flowering parts of weeds. Within pygmy rabbit habitat, weed crews could temporarily displace individual pygmy rabbits while weed treatment efforts were being conducted. However, weed crews would generally only be in a given treatment area for a day and generally only a few hours potentially revisiting a site once or twice in the same growing season; therefore there would be no long term impacts to pygmy rabbits. Herbicides and surfactants applied as described in the Proposed Action pose no risk to pygmy rabbits. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for small mammals such as the pygmy rabbit. Because the pygmy rabbit feeds almost entirely on sagebrush, which would not be targeted for treatment with herbicide, there is little risk of a pygmy rabbit consuming enough treated vegetation to cause an adverse effect. Because pygmy rabbit habitat is highly vulnerable to annual grass invasions, particularly after a wildfire, applications of pre- emergent herbicides to control cheatgrass will likely be a common technique in sagebrush communities. Sagebrush is a desirable native species and would be avoided during any treatment method.

There will be no long term negative impacts to pygmy rabbit habitat under the proposed action from manual or herbicide treatments. From a habitat and forage perspective, sagebrush, is critical to the pygmy rabbit. As mentioned above, herbicides will be carefully selected and applied to reduce the potential for inadvertent damage or mortality to sagebrush. Areas that are treated manually will likely revegetate within the same growing season or by the following year. Over the long term, control and eradication of invasive species, in some cases the leading edge or satellite occurrences of cheatgrass, in pygmy rabbit habitat will help maintain quality habitat for this species.

Insects: Currently there is no known insect or pathogen that is effective in reducing cheatgrass infestations but non-native thistles can occasionally occur in some portions of pygmy rabbit habitat, where use of insects would be effective. If biological controls are determined to be the appropriate treatment method, under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) and NDA will be used. Before being permitted by APHIS, NDA, and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

Individual pygmy rabbits that may occur in areas adjacent to treatment sites may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews). Pygmy rabbits may be flushed from the site and avoid the area while treatments are occurring. However, pygmy rabbits live and birth in deep burrows (almost two feet deep) which would help protect adults and young from weed treatments and disturbance. While mechanical treatments and tarping could occur within pygmy rabbit habitat, impacts from these treatments are expected to be minor and displace individual pygmy rabbits for a short period of time but not result in any long term impacts.

Some short term impacts to pygmy rabbit habitat may occur while native plant communities recover. Recovery period could take potentially up to five years for reestablishment of native grasses and re-sprouting of sagebrush. Over the long term, habitat conditions would be improved by removing non-native grasses and allowing for sagebrush stands to recover.

Cumulative Impacts: Wildfires and invasion of non-native annual grasses are two of the largest threats to pygmy rabbits. Within the last decade on the INF, wildfire has minimally affected habitat, if at all, due to the small portion of their range that overlaps with Inyo NF. Cheatgrass and other invasive species are present in burned areas near or within suitable habitat; however, post fire restoration efforts, such as seeding and active weed management have helped with native plant restoration. To reduce the threat of future high intensity fires, the BLM, the Forest Service and other local agencies have completed or are in the process of completing multiple fuels reduction projects and habitat restoration projects in or near important sage grouse habitat which could potentially benefit the pygmy rabbit as well (Bi-State Plan 2012). Under the proposed action, treatment of invasive species may also help reduce the fuel loading in sagebrush habitat as well as reduce the threat of increased infestations following a wildfire. The effects from the proposed action would not incrementally result in negative impacts to pygmy rabbits when considered along with the effects of past, present and reasonably foreseeable actions.

Determination

Based on the analysis conducted, it is my determination the proposed action may impact individual pygmy rabbits but will not lead to a trend toward federal listing or a loss of viability.

NO ACTION ALTERNATIVE

Direct, Indirect, and Cumulative Effects

Of the Forest Service Sensitive species analyzed here, there would be no direct effects to individuals or their current habitat conditions as a result of the No Action Alternative. Previously analyzed control methods would continue to be applied to known invasive plant infestations. Acreage of existing infestations would

most likely increase as manual control methods have proven inadequate in the past. As a result, infestations would be expected to slowly increase in spatial extent and density, and these infestations could be the seed source resulting in new infestations within the project area. Over time, this could result in a reduction in native plant species and healthy native plant communities in the affected areas, possibly reducing or negatively impacting habitat for sensitive species and locally desirable native species including pollinators.

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